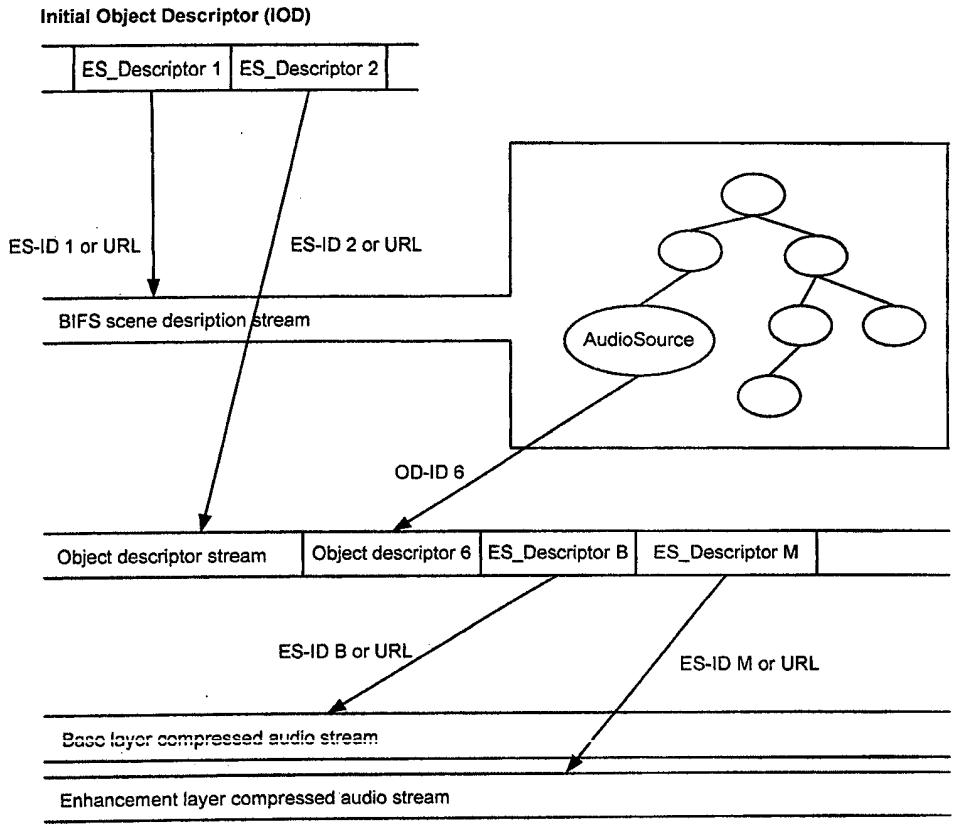


Fig. 1 (prior art)

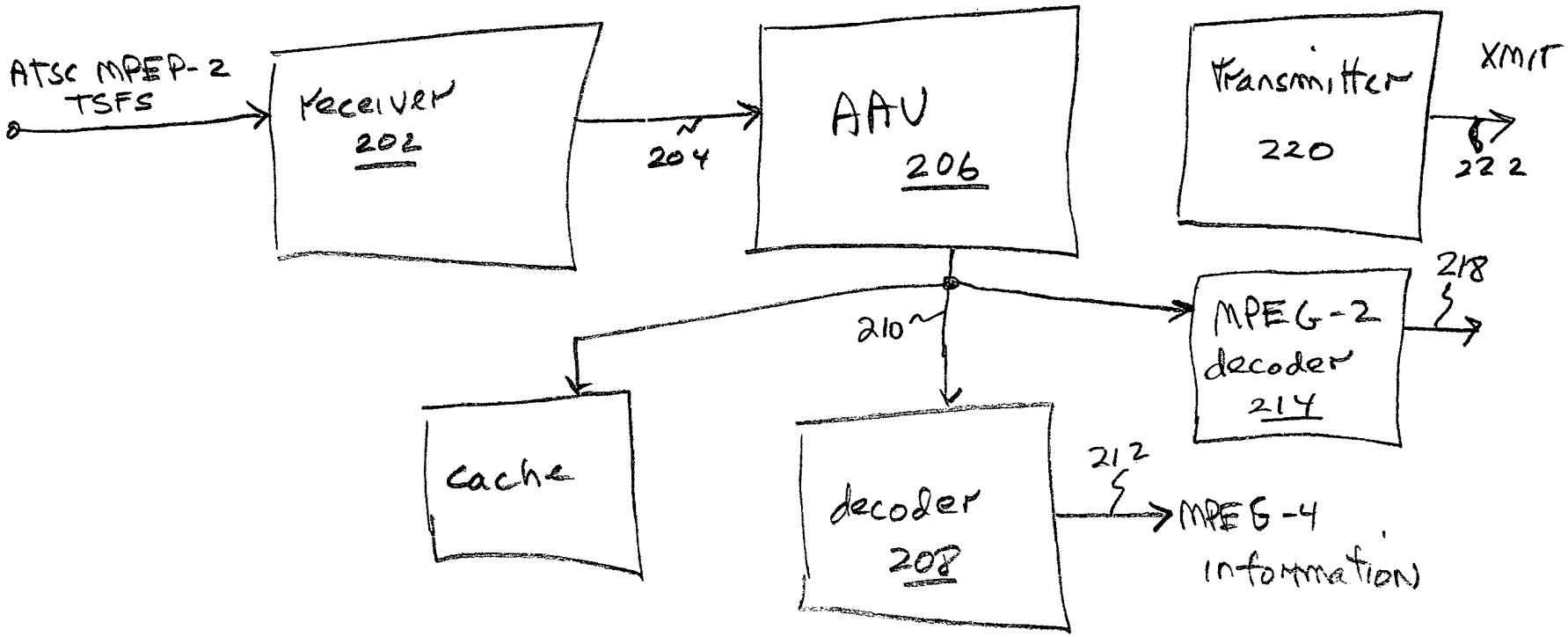

ATSC MPEP-2
TSFS
Receiver
202
204
AAU
206
Transmitter
220
XMIT
222
218
MPEG-2
decoder
214
210
cache
decoder
208
212
MPEG-4
information
200

Fig. 2

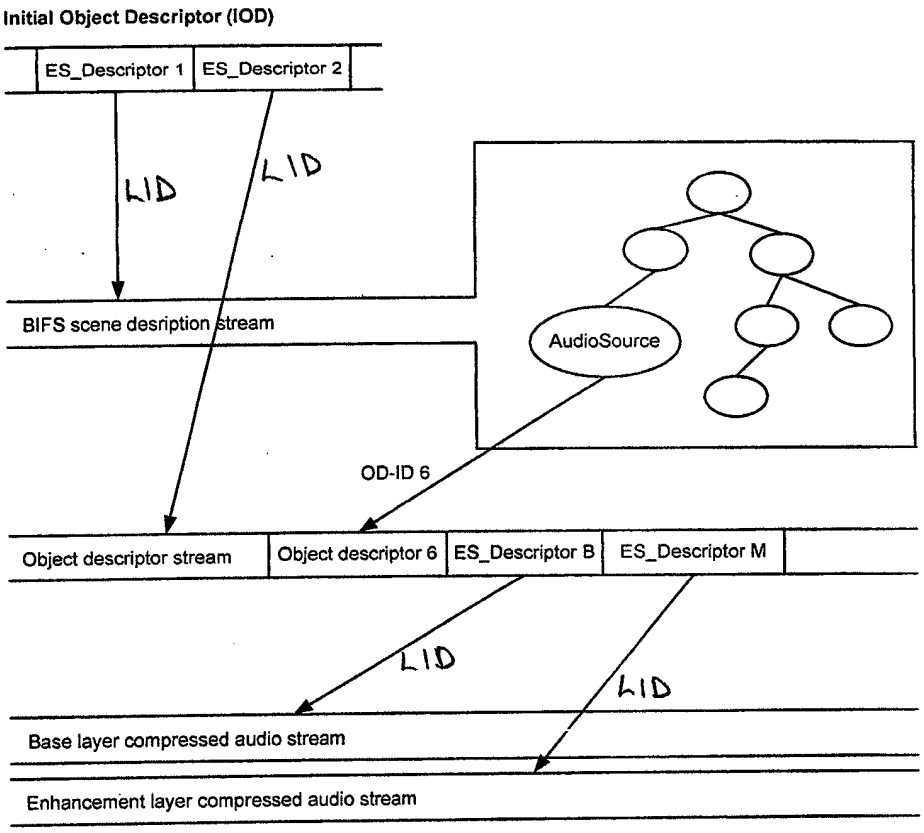

Initial Object Descriptor (IOD)
ES_Descriptor 1
ES_Descriptor 2
LID
LID
BIFS scene desription stream
AudioSource
OD-ID 6
Object descriptor stream
Object descriptor 6
ES_Descriptor B
ES_Descriptor M
LID
LID
Base layer compressed audio stream
Enhancement layer compressed audio stream

Fig. 3

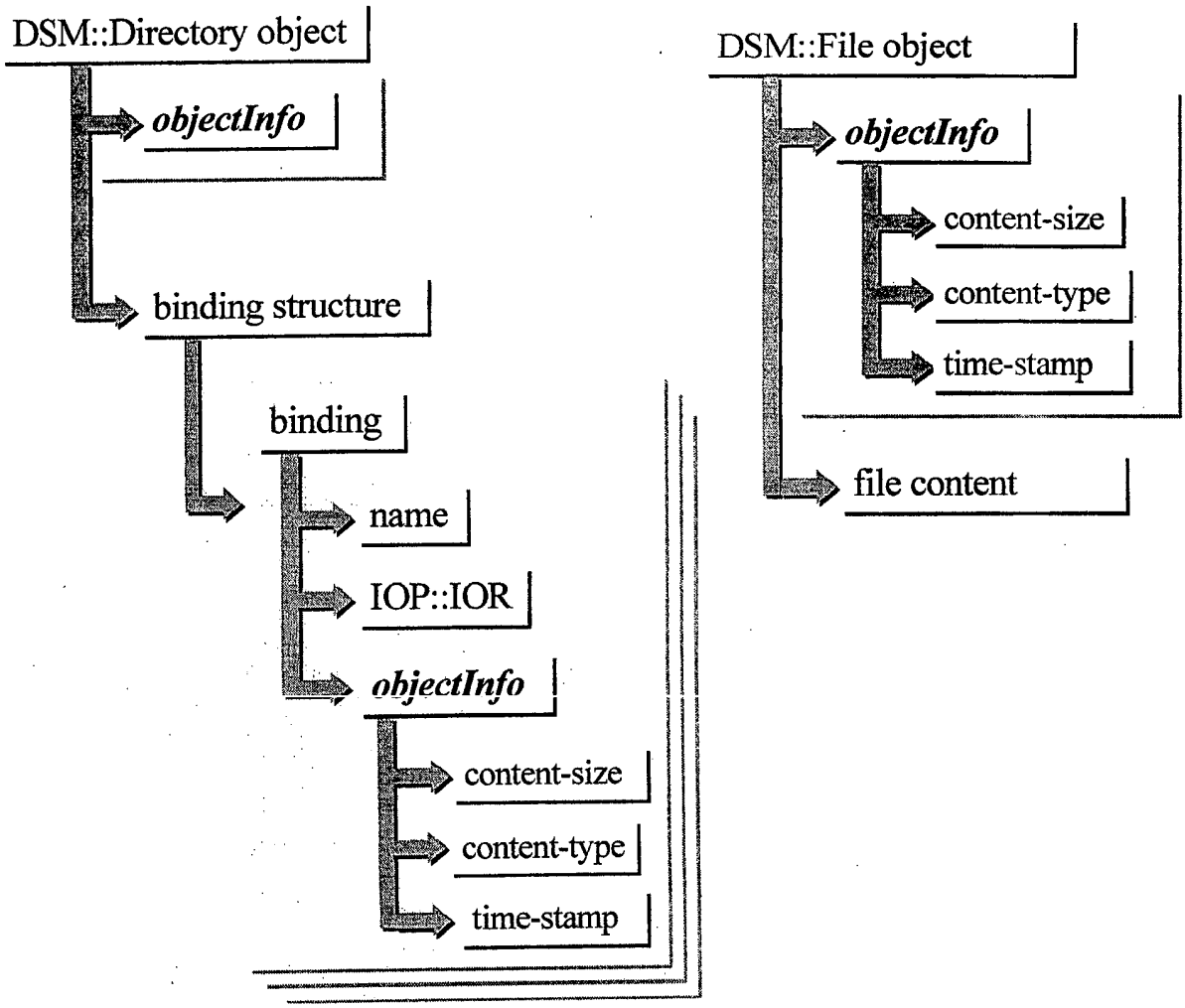
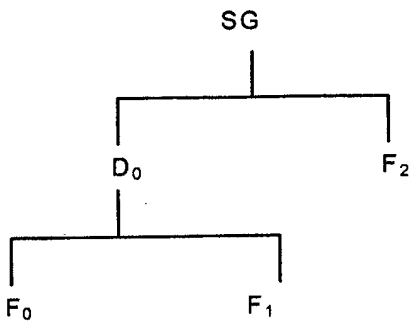

DSM::Directory object
objectInfo
binding structure
binding
name
IOP::IOR
objectInfo
content-size
content-type
time-stamp
DSM::File object
objectInfo
content-size
content-type
time-stamp
file content

Fig. 4

A simple directory structure



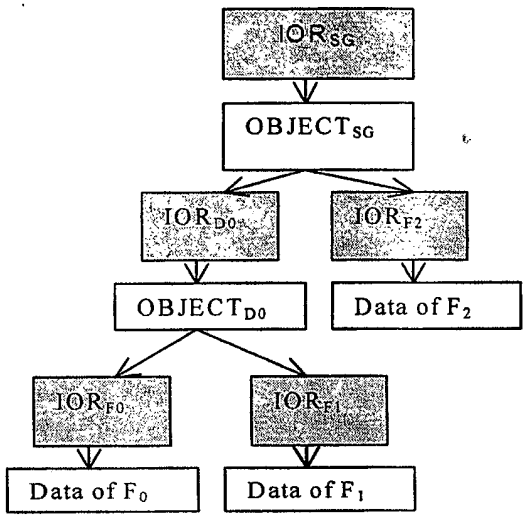


Fig. 5

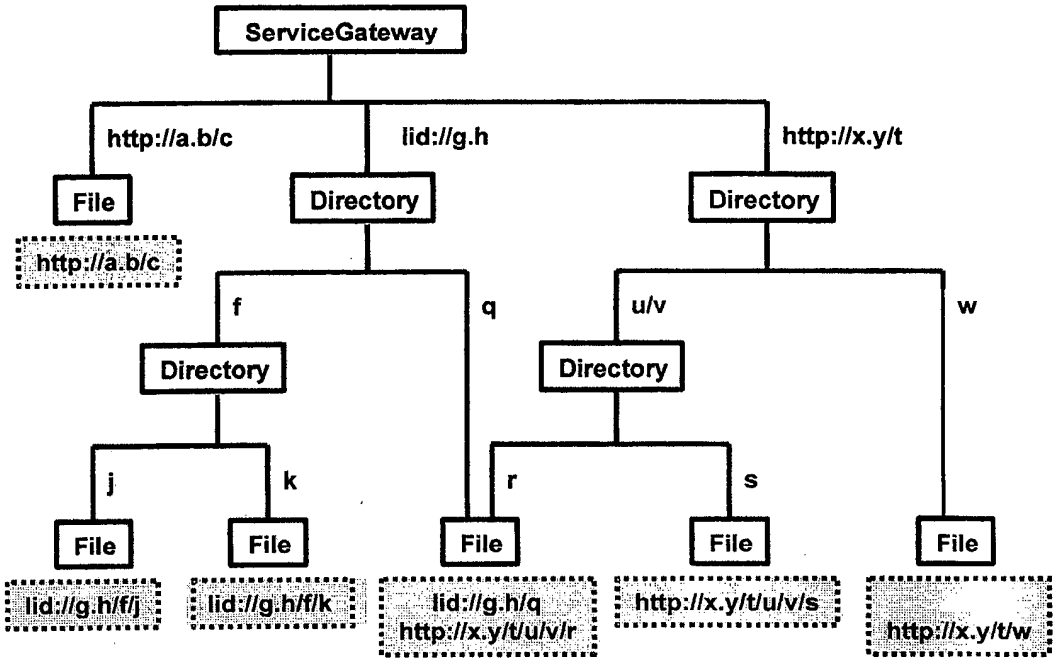
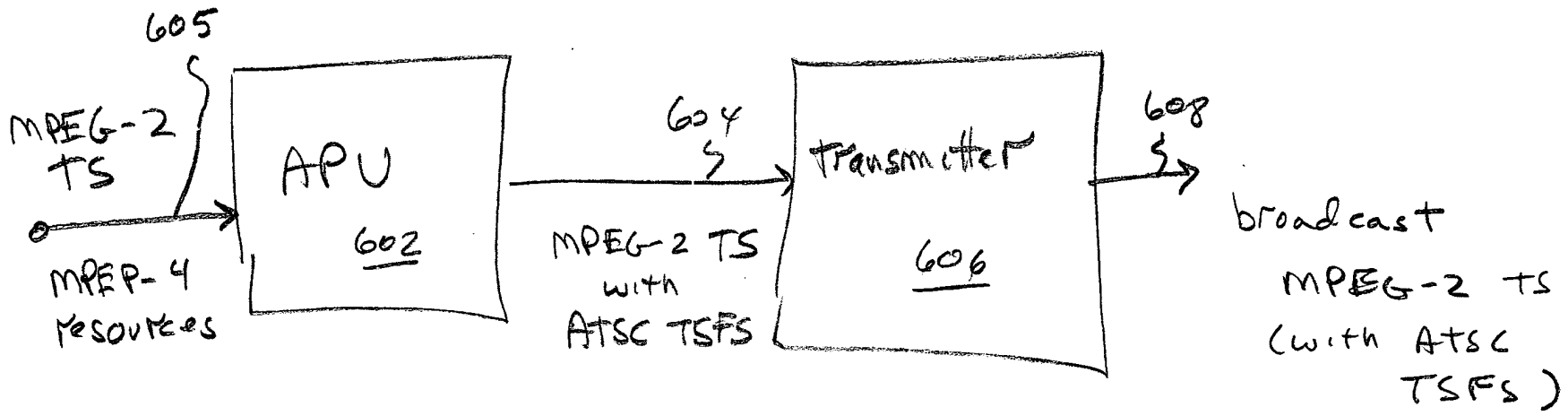

ServiceGateway
http://a.b/c
lid://g.h
http://x.y/t
File
Directory
Directory
http://a.b/c
f
q
u/v
w
Directory
Directory
j
k
r
s
File
File
File
File
File
lid://g.h/f/j
lid://g.h/f/k
lid://g.h/q
http://x.y/t/u/v/r
http://x.y/t/u/v/s
http://x.y/t/w

Fig. 6


605
MPEG-2 TS
MPEP-4 resources
APU
602
604
MPEG-2 TS with ATSC TSFS
Transmitter
606
608
broadcast MPEG-2 TS (with ATSC TSFs)

600

Fig. 7

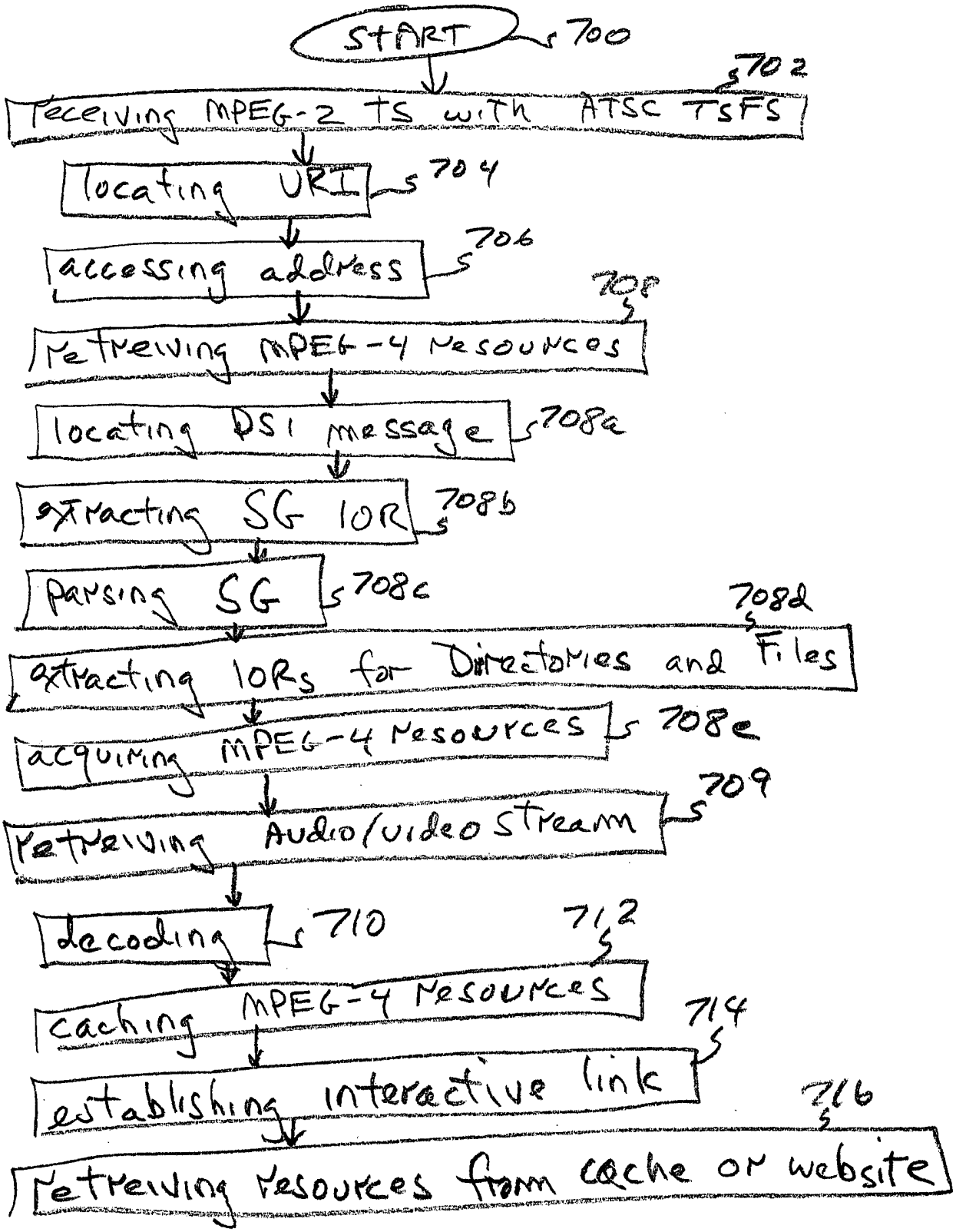

START
700
Receiving MPEG-2 TS with ATSC TSFS
702
locating URI
704
accessing address
706
Retrieving MPEG-4 Resources
708
locating DSI message
708a
extracting SG IOR
708b
Parsing SG
708c
extracting IORs for Directories and Files
708d
acquiring MPEG-4 Resources
708e
Retrieving Audio/Video Stream
709
decoding
710
caching MPEG-4 Resources
712
establishing interactive link
714
Retrieving Resources from cache or website
716

Fig. 8

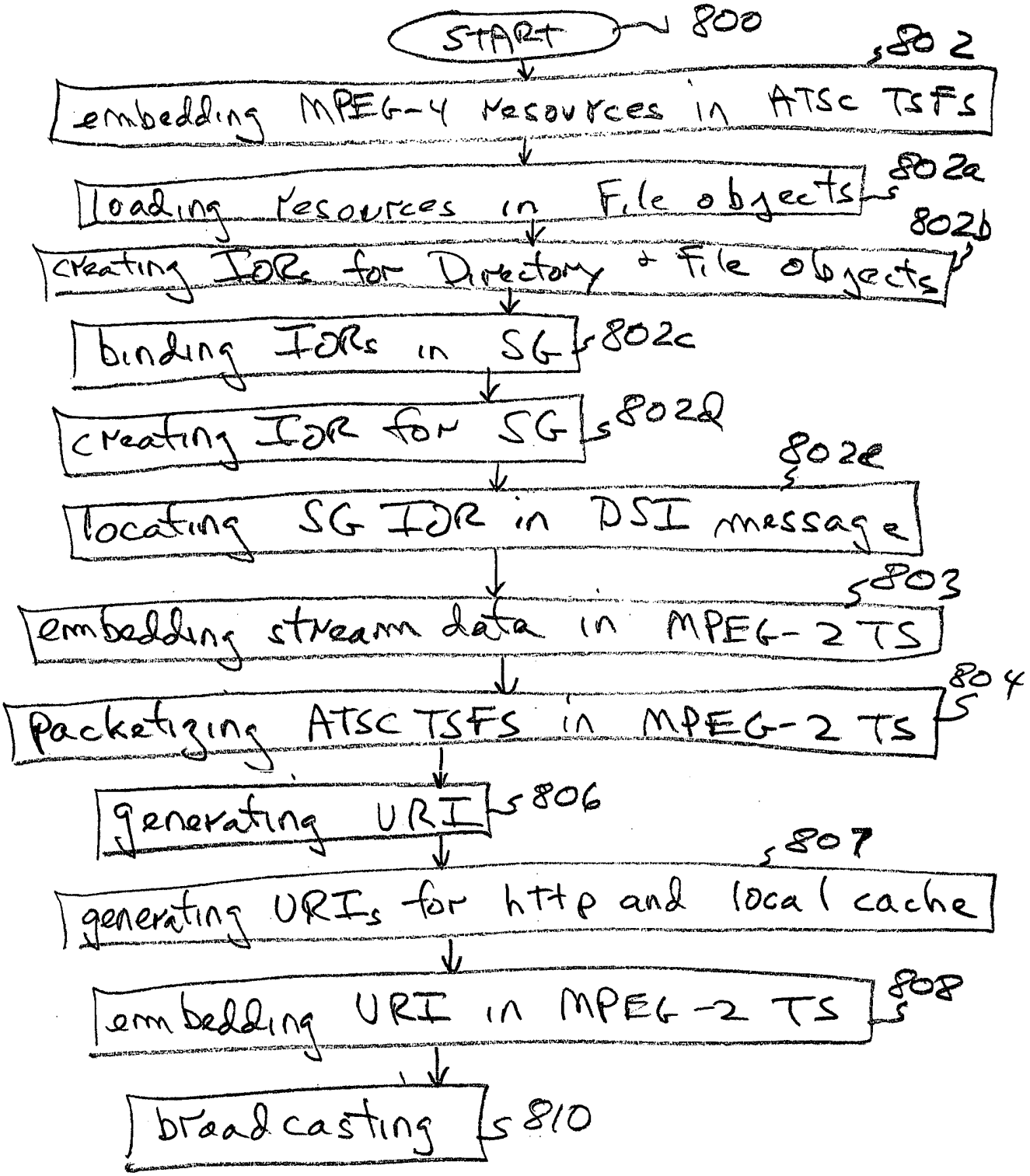

START
800
802
embedding MPEG-4 resources in ATSC TSFs
802a
loading resources in File objects
802b
creating IORs for Directory + File objects
802c
binding IORs in SG
802d
creating IOR for SG
802e
locating SG IOR in DSI message
803
embedding stream data in MPEG-2 TS
804
packetizing ATSC TSFS in MPEG-2 TS
806
generating URI
807
generating URIs for http and local cache
808
embedding URI in MPEG-2 TS
810
broadcasting

Fig. 9